WHAT IS CLAIMED IS:

1. An electrode material for a lithium secondary battery comprising alloy particles comprising silicon as a major component and having an average particle diameter of 0.02 μm to 5 μm, wherein the size of a crystallite of the alloy is not less than 2 nm but no more than 500 nm and an intermetallic compound containing at least tin is dispersed in a silicon phase.

2. The electrode material for a lithium secondary battery according to claim 1, wherein the intermetallic compound containing at least tin further contains at least one element selected from the group consisting of copper, nickel, cobalt, iron, manganese, vanadium, molybdenum, niobium, tantalum, zircon, yttrium, lanthanum, selenium and magnesium.

3. The electrode material for a lithium secondary battery according to claim 1, wherein the alloy comprising silicon as a major component further comprises at least one metal element selected from the group consisting of tin, aluminum, zinc, indium, antimony, bismuth and lead.

4. The electrode material for a lithium secondary battery according to claim 1, wherein the content of

silicon in the alloy is not less than 50% by weight but no more than 90% by weight.

5. An electrode structure comprising the electrode material set forth in claim 1, a conductive auxiliary material, a binder and a current collector.

6. The electrode structure according to claim 5, wherein the conductive auxiliary material is a carbonaceous material.

7. A secondary battery, which comprises a negative electrode using the electrode structure set forth in claim 5, an electrolyte and a positive electrode, and which utilizes an oxidation reaction of lithium and a reduction reaction of lithium ions.

8. An electrode material for a lithium secondary battery comprising alloy particles comprising silicon as a major component and having an average particle diameter of 0.02 μm to 5 μm, wherein the size of a crystallite of the alloy is not less than 2 nm but no more than 500 nm and an at least one intermetallic compound containing at least one element selected from the group consisting of aluminum, zinc, indium, antimony, bismuth and lead is dispersed in a silicon phase.

9. The electrode material for a lithium secondary battery according to claim 8, wherein the alloy comprising silicon as a major component further comprises at least one metal element selected from the group consisting of tin, aluminum, zinc, indium, antimony, bismuth and lead.

10. The electrode material for a lithium secondary battery according to claim 8, wherein the content of silicon in the alloy is not less than 50% by weight but no more than 90% by weight.

11. An electrode structure comprising the electrode material set forth in claim 8, a conductive auxiliary material, a binder and a current collector.

12. The electrode structure according to claim 11, wherein the conductive auxiliary material is a carbonaceous material.

13. A secondary battery, which comprises a negative electrode using the electrode structure set forth in claim 11, an electrolyte and a positive electrode, and which utilizes an oxidation reaction of lithium and a reduction reaction of lithium ions.